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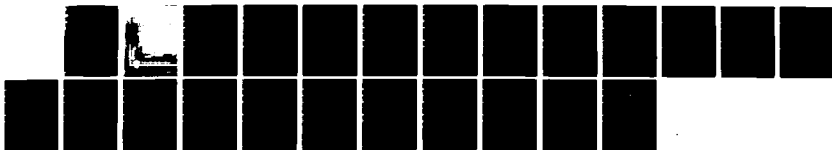
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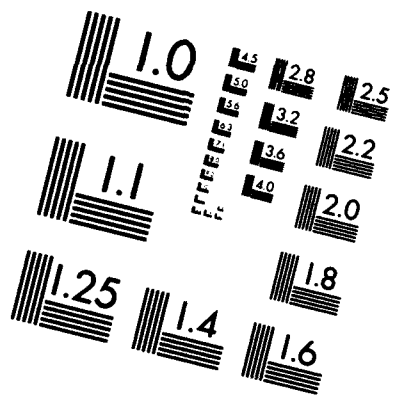
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USAWC MILITARY STUDIES PROGRAM PAPER

E-FORCE: THE FUTURE FOR ENGINEERS

AN INDIVIDUAL ESSAY

by

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ABSTRACT

AUTHOR: Russell L. Fuhrman, LTC, EN

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Combat engineer support to mechanized forces has been described as uncoordinated, unimaginative, and poorly planned and executed. Seldom is the synergistic potential of engineers realized on today's battlefield. While doctrine has changed and technology has made quantum leaps in the last 40 years, the engineer support concept for heavy forces has remained unchanged. E-Force corrects current engineer support deficiencies in heavy forces, creates an environment to significantly improve future engineer-maneuver effectiveness, and eliminates several in-house engineer problems. Implementation costs are relatively low and organizational changes can be accomplished within current force structure. Maneuver and engineer commanders must push for immediate implementation.

The concept of an engineer regiment organic to heavy divisions (E-Force) is the best combat engineering proposal to come out of the engineer community in years. E-Force solves current engineer support deficiencies in heavy forces, creates an environment to significantly improve future engineer-maneuver effectiveness, and eliminates several in-house engineer problems. Maneuver commanders and engineers knowledgeable in mechanized operations applaud E-Force and its potential to increase maneuver force effectiveness. The E-Force concept is even more appealing when one realizes it can be implemented quickly, at relatively low cost, and within current manpower constraints. Now is the time for all to assess current combat engineer (sapper) deficiencies and the potential E-Force offers; and support E-Force's immediate implementation. No one has offered a better solution, and the principal question should be why has it taken so long!

E-Force provides each heavy division with an organic engineer regiment consisting of three small engineer battalions--each affiliated with a maneuver brigade, plus a headquarters element and specialized units (e.g. Bridge Company) at division. While the final design is still undergoing minor changes, the regiment will number 1600-1700 personnel and will be formed from the divisional and corps direct support engineer battalions associated with each heavy division. This regiment is only equipped for combat engineering (sapper) tasks and conventional construction



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capability is moved to corps. The engineer regiment will be organized and operated much like division artillery.

As a mechanized division engineer, I was continually frustrated in my attempts to synchronize engineer support at maneuver battalion, brigade, and division level in the time frames required for airland battle. Initially, my frustration centered on the engineer's lack of modern combat systems. As I became more experienced, I realized hardware was only one aspect of the problem. Fundamental deficiencies exist in the engineer concept of support for mechanized forces, degrading the maneuver commander's ability to synchronize engineers. These deficiencies are being compounded by modern doctrine and technologies. Shortcomings exist in (1) engineer expertise and planning capability available to maneuver commanders, (2) combined arms engineer training, (3) and engineer command and control capabilities. Until these deficiencies are corrected, the synergistic potential of engineers will rarely be obtained on the battlefield.

Heavy force engineer shortcomings can be attributed to a 40 year old concept that's not compatible with today's doctrine and technologies. The engineer support concept for mechanized forces has changed little since World War II. Divisions are provided with minimal engineer capability and are supplemented with corps assets as required. Current maneuver doctrine, hardware, tactics, and organizations are radically different from those of World War II. Today,

battalions occupy frontages controlled by brigades during World War II, brigades that of divisions, and divisions that of corps, etc. Command and control is much more complex and decision cycles much shorter. The lethality and intensity of the battlefield has significantly increased. Maneuver operations have become more decentralized; emphasis has shifted from divisions toward brigades. The centralized engineer concept, with the bulk of combat engineer assets at corps, can no longer provide maneuver commanders the responsive sapper support required.

The most critical deficiency is inadequate engineer expertise and planning capability for maneuver commanders. The task force engineer is a platoon leader who is trying to command his platoon and plan a task force's engineer effort in a time sensitive environment. Lieutenants do not have the experience or training to accomplish this task. The result is, at best, marginal engineer support to the task force. The same problem exists at brigade, where the brigade engineer and engineer company commander (both captains) lack the expertise and available time to provide the brigade commander with quality sapper support. At division, the engineer battalion commander is the division engineer in addition to commanding one of the largest and most complicated battalions in the division. As the division engineer, he must concentrate on the future (planning and resourcing); as a battalion commander, he is concerned with the present (timely execution

of assigned missions). The two rolls are in conflict and neither gets done well.

Providing appropriate engineer expertise solves only half the problem. Maneuver elements must be staffed for 24 hour engineer operations. This capability does not exist at any maneuver echelon. Ad hoc organizations are the current solution. This results in engineer operational and training plans that are often described as unimaginative, uncoordinated, unrealistic, and unsupportable.

Combined arms engineer training is the second major deficiency. How well a combined arms operation is executed in combat is a function of training. Few combat engineer tasks can be done in isolation. A typical mobility operation, breaching a mine field, requires maneuver systems, artillery, smoke, and much more. Maneuver commanders must train themselves as platoon and company commanders to use sappers, just as they train themselves to use artillery. Combined arms training requires the combat "slice" (to include planning and operational support) to be readily available to maneuver teams. Unfortunately, this is not the case. Divisional engineer platoons and companies orient on their parent battalion's requirements first and their supported brigade's and battalion's requirements second. Corps engineers seldom train with their maneuver counterparts. The result--maneuver-engineer combined arms battle drills are practically nonexistent.

Once planning and training are in order, command and control is key to tactical synchronization. Like artillery, engineer effort must be concentrated to be effective and provide the combat multipliers required. Since engineers are comparatively slow to react on the battlefield, the only way this can be achieved is through good planning and effective command and control. This is the third engineer deficiency. Engineers are deployed across the division front, usually operating on squad and platoon size missions. When supporting a brigade, the engineer company commander must maintain contact with four organizations as a minimum. His battalion headquarters provides command, logistics, and administrative support. The brigade engineer provides his operational missions, plus the brigade's threat situation. He must be in close contact with the battalion or battalions he is supporting; and he must control his company assets which may be deployed across the entire brigade sector. An engineer company has neither the equipment nor manpower to maintain communications with all these organizations. From a control aspect, the engineer company must function as a battalion. The same control problem exists at division. The division engineer must control more than two engineer battalions across a division sector with a battalion control structure. To compensate for this control problem, ad hoc engineer task forces are created at brigade and division. Engineer resources are decentralized based on the maneuver scheme. These ad hoc

task forces are ill-equipped and trained to make the rapid changes in support relationships required of airland battle. Engineer synchronization requires a control structure as capable as that of the maneuver commander's.

E-Force corrects these deficiencies. The regimental engineer commander would be the division engineer and his staff would provide division with the required expertise. The regiment would have the communications and personnel assets to effectively control engineers across the division. The brigade engineer would be the affiliated engineer battalion commander. This provides the brigade commander with the sapper expertise and planning capability he requires. With an engineer battalion, the brigade has sufficient engineer assets to conduct good combined arms training. The engineer battalion has the capability to effectively control engineers across the brigade sector. Maneuver battalions would have an affiliated engineer company. Maneuver battalion commanders would have the engineer expertise and planning capability they require, plus the dedicated engineers needed for combined arms training. E-Force complements maneuver flexibility by providing commanders at battalion through division with an engineer structure that is responsive to maneuver needs in war and peace.

In addition to solving engineer support problems for heavy forces, E-Force offers the Army much more. Engineer and maneuver commanders don't always do a good job of

communicating. Neither totally understands the problems of the other; nor is there mutual agreement on the engineer to maneuver ratio required to optimize the combat effectiveness of the task force. Lack of understanding breeds suspicion and parochialism. The current divisional structure contributes to this. There are insufficient engineers within tactical organizations to develop the necessary maneuver-sapper cross fertilization. There is no engineer expertise at the COL level in divisional units to interface with the other major subordinate commanders even though approximately 2000 engineers will be providing direct support to a division in combat. The senior engineer is a lieutenant colonel who must be both a battalion commander and a division engineer. He has little time to interface with fellow maneuver battalion commanders. The same problem exists at lower grade levels; three majors and 12 captains are inadequate to provide an environment for good engineer-maneuver cross training for junior officers. The tactical expertise differential between engineers and their maneuver contemporaries further compounds this problem. Engineers are lucky to serve one tour in divisions while their maneuver counterparts serve several tours. Branch "stove piping" further complicates an already unacceptable situation.

Combined arms operations are highly complex. The maneuver commander is the orchestrator; he must properly employ all players. Unfortunately most maneuver commanders

have little experience with engineers. The last time task force commanders were exposed to engineer theory probably was at their advance course. Maneuver commanders focus on maneuver elements and hardware employment, seldom on supporting arms theory. Engineer planning to support the maneuver scheme is relegated to engineers who may or may not understand how maneuver elements fight.

This lack of daily sapper-maneuver contact at the tactical level has negative impacts for engineers as well as maneuver soldiers. Without daily contact, engineers do not become seasoned in how maneuver platoons and companies fight. They're not exposed to maneuver battle drills and SOP's that must become second nature to them. Without this exposure, engineers are hard pressed to contribute to fast moving tactical situations. Few engineers understand how battalion and brigade TOC's operate. Little tactical experimentation and exchange of ideas or concepts take place. Engineer-maneuver comradeship and professionalism don't develop overnight.

E-Force solves this personnel quality and quantity problem and will lead to unprecedented maneuver-engineer interface. The real dividends will be achieved in succeeding years when maneuver and engineer commanders (trained in combined arms operations at all tactical levels) can realistically and rationally assess the engineer contribution to the battle and appropriately prioritize engineer hardware

and force structure requirements.

Another problem E-Force solves is engineer missions (sapper verses construction). Engineers have been all things to all people. This has been perpetuated by the design of engineer TOE's to give each unit the capability to accomplish a full spectrum of engineer tasks. This has resulted in divisional engineers dabbling in construction projects when they should have been working on battle drills; and corps battalions dabbling in close combat tasks to display their flexibility or justify force structure (Combat Heavy or Construction Battalion??). Frequently, maneuver commanders have contributed to the problem by preferring their engineers to do improvement projects at the expense of combat training; and, unfortunately, engineers are often all too ready to comply, since many are more comfortable in a construction engineering than sapper environment. As a result, today's Army has a great corps of construction/project engineers and few true sappers. The Army needs both, but the balance needs to be better.

By removing construction MOS's and equipment from division engineer TOE's, E-Force solves this problem. Divisional engineers are true sappers and the engineer construction capability now resides at corps, able to come into the division on a mission basis if required. E-Force will produce quantum leaps in maneuver-sapper combined arms tactics and battle drills. Habitual associations coupled with

the natural competition of engineer battalions within a sapper regiment to do things better will lead to many new innovations.

E-Force orients the maneuver-engineer team to the future. While no one knows what the 21st Century battlefield will be like, current trends provide valuable insights. Technology will continue to improve weapon system accuracy and lethality. Increased costs will result in fewer high technology systems; therefore, survivability of each system will be more critical. Forces will have to dig in or move to survive. Improved conventional munitions and nuclear and chemical weapons (if used) will create significant numbers of complex obstacles. "Smart" mines, many with self destruct, stand-off, and remote control features will change the concept of mine warfare. The ability to rapidly employ this new generation of mines with air, artillery, and ground systems will give mine warfare an offensive capability. No longer will commanders have to guess enemy dispositions and emplace barriers accordingly; but rather, they'll be able to shape the battlefield as the enemy's scheme of maneuver unfolds.

Brigades will be the keystone combat organization of the 21st Century. Improved acquisition capabilities will result in a more dispersed battlefield with unit operational areas increasing in size. The ability to quickly concentrate forces will be critical. Decision cycle times will continue to decrease making command and control more difficult. The

complexity of the battlefield will require an increased leader to led ratio. The trend to smaller units capable of independent operations will continue. Engineer synchronization must occur automatically at all maneuver echelons, facilitated by good maneuver-sapper interface. E-Force with its decentralization, habitual associations, and concentration of sappers at brigade level supports these trends.

Besides improving current engineer support to heavy forces and offering significant long term maneuver-engineer potential, E-Force solves several internal engineer problems. It offers engineers the opportunity to better align and equip their organizations. Current engineer TOE's are over equipped and undermanned. Organizations have sets, kits, and outfits; plus some major end items that see little use. The principal reason for this is that engineers have never been able to agree on a division of labor between divisional, corps, and theater engineers (sapper versus construction engineering). Engineers wanted to be "all things to all people" and engineer units have been equipped to support this concept.

The construction rather than sapper aspect has been the engineer focus and for good reason. Historically, construction requirements have far out weighed sapper needs. "Nation building" in peace and war has been a central theme. In Vietnam, the sapper effort associated with maneuver forces was small compared to the massive construction effort required

of the engineer brigades. The diversity of types of maneuver units, each with unique sapper requirements, frustrated efforts to place added emphasis on sapper requirements. As a result, few sapper systems have been fielded or new innovations implemented in the last 40 years.

The crux of the problem is that engineer groups and brigades are large organizations with well defined, common missions. Sapper organizations at division and below are diverse organizations with less commonality. Lieutenant colonel division engineers are ineffective in articulating requirements compared to a relative cohesive group of brigade and group commanders. E-Force solves this problem with a three-fold approach. (1) It provides engineers at division and below with only a sapper capability. (2) The number of full time sappers within the force structure is significantly increased. (3) The creation of divisional engineer regiments with O-6 commanders will create a sapper advocacy on par with that of engineer groups and brigades. Both sapper and construction engineer organizations will benefit by concentrating their focus rather than diversifying it.

Another engineer problem E-Force solves is "who's in charge?" Under current doctrine, as corps engineers supplement division engineers, a situation quickly develops where the number of corps engineers in a division sector exceeds that of the organic division engineers. In many cases an engineer group may support a division. The question then

becomes who is the senior engineer reporting to the division commander: the group commander, who is unfamiliar with the division's SOP's and maneuver personalities, or the division engineer who must also command his battalion. Each solution has significant disadvantages. Usually ad hoc organizations appear at all maneuver levels, with the final result being less than optimal engineer command and control. Engineers have worked this problem for years and the solution has always been elusive.

E-Force solves the problem by giving the division an O-6 engineer and the staff to control all engineers in the division sector. The placement of more sappers in the division lessens the requirement for corps support, and alignment of sapper battalions and companies with maneuver brigades and battalions simplifies command and control. Less "ad hocism" is required.

The creation of a "sapper corps" is a third engineer benefit. While many career engineers would prefer to remain associated with combat (sapper) engineering, current engineer personnel force structure does not permit this. Engineer troop and command assignments are limited at the O-6 level to a few groups and brigades which are more construction than sapper oriented. Few corps engineer units train with tactical units on a frequent basis. Most engineer O-6 commands are in engineer districts.

To be competitive, engineers must diversify early in

their careers. This results in few repetative assignments in like units. The engineer soon becomes a "jack-of-all-trades and master of none." This is detrimental to sappers as well as construction engineers. Considerable numbers of experts are required in both disciplines.

E-Force provides engineer personnel force structure with a better balance. For the first time there will be a sapper track and an opportunity for significant numbers of engineer sappers to command at the O-6 level. The construction, district, and facility engineer communities will also benefit. Engineers in these specialty areas will be able to devote more time to civil engineering and management training. They will not feel the pressure of sappers crossing over to their career field at the O-6 level. Engineer specialty alignment should be simplified.

With all the E-Force pluses, a logical question is why has it taken so long to implement. There is no simple answer. Vietnam inhibited any natural evolution that might have modified the World War II engineer support concept to one capable of supporting the maneuver doctrine of the 80's. The Army looked to the engineers for "nation building" and counterinsurgency operations required few new sapper innovations. Almost two decades of conflict produced a corps of superb construction engineers. On the maneuver side, Vietnam presented the maneuver commander with few sapper tasks that had to be executed under fire. Lines of communications

and the hardening of fixed positions (survivability) were primary maneuver priorities for engineers. This resulted in a generation of maneuver officers who looked at engineers as more of a construction agency than sappers. Vietnam brought maneuver level engineer combined arms innovation to a standstill. Little maneuver advocacy existed for improving sapper capability. Competition for dollars and spaces within a fiscal and manpower constrained peace time environment further complicated the problem.

Within the engineer community sapper innovation has been inhibited by the lack of a strong advocacy. Most engineers were sappers as company grade officers, a few at field grade level, fewer yet at the O-5 command level and none at the O-6 level. The diversity of tactical organizations further dilutes an already weak advocacy. Peace time force structure realities have focused engineer effort on stemming the erosion of active force engineer capability at corps and theater levels.

Finally, maneuver-sapper innovation has been inhibited by a community of vocal maneuver and engineer "experts." Few of these "experts" have experienced or studied the complexities of moving a combined arms team through a complex obstacle "in stride and under fire." There are members of the maneuver community who believe the threat posed by mines, natural and man made obstacles is minimal compared to other maneuver threats. There are engineers with a "D-7" mentality

who believe a majority of sapper tasks in the forward battle area can be accomplished with standard or partially modified commercial engineer hardware and unique sapper equipment is too expensive to design and procure.

The bottom line is E-Force solves today's engineer support deficiencies in heavy forces and provides both the Army and engineers with significant long term benefits, the most important of which is an environment where maneuver-sapper innovation can mature. Out of this maturing process will evolve an optimized sapper structure which will complement the maneuver force it's supporting.

E-Force must be implemented immediately. Some believe E-Force implementation should be linked to the fielding of new engineer systems; otherwise, there may be a temporary decrease in the capability of divisional engineers as construction assets are moved to corps and replacement sapper hardware is not available. The increased efficiency gained by improved expertise and planning capabilities, combined arms engineer training, command and control, and environment for maneuver-sapper innovation will more than offset temporary hardware deficiencies. To hold this superb concept hostage to hardware in a time of constrained budgets is risky business. Nevertheless, engineer hardware modernization is sorely needed. To be a truly effective member of the combined arms team, engineer hardware must be compatible with the mobility and tactical capabilities of maneuver systems. The fact that

engineers are still breaching minefields the way they did in World War II is evidence enough. The adage, "lead, follow, or get out of the way," applies. Let E-Force lead engineers into the 21st Century.

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